20

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,349	02/05/2001	Clayton Brian Atkins	10001600-1	5179

7590 12/13/2004

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
PENDERGRASS, KYLE M	
ART UNIT	**PAPER NUMBER**
2624	

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/777,349	ATKINS, CLAYTON BRIAN	
	Examiner	Art Unit	
	Kyle M Pendergrass	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2,3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 & 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto et al. (US 5,930,385).

Regarding claims 1 & 10, Fujimoto et al., discloses a method and apparatus to carry out the method *(column 2 lines 30-32)* of enhancing an input digital image having color features *(column 2 lines 30-38 describe a method for producing a document with fine appearance originating from a colored document)* comprising:

converting said input digital image to a binary image *(column 2 lines 32-36 disclose an apparatus & method for image conversion of a color input into a monochrome document, column 5 lines 24-27 disclose conversion of a color image into a monochrome image)* of first and second type pixels such that pixels of said input digital image that define said color features are substantially converted to said first type pixels of said binary image *(Figure 3 discloses dividing the input image into regions for color specification, column 6 lines 56-59 disclose assigning blocks of image colors to regions)*;

changing the resolution of said binary image to derive a modified binary image *(column 11 lines 8-9 disclose converting the image input into a color image of different resolution)*;

and selectively inserting colors into pixels of said modified binary image to produce an output digital image having modified color features that differ in resolution with said color features of said input digital image *(column 8 lines 44-45 disclose assigning a color to each of the regions containing "same colors", in which, according to column 3 lines 61-64, "same color" includes slightly different color values that would be selectively assigned one particular color value, thus modifying the image)*.

Note: all programs (column 11, lines 10-15) run by a computer require different program codes (means) to perform different functions.

Regarding claims 2 & 11, Fujimoto et al., discloses the method and apparatus of claims 1 & 10, respectively, wherein said step of converting said input digital image to said binary image includes comparing color components of said input digital image with predefined thresholds to classify said pixels of said input digital image as either said first type pixels or said second type pixels of said binary image *(column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k')*.

Regarding claim 3, Fujimoto et al., discloses the method of claim 2 wherein said step of comparing said color components of said input digital image includes classifying

said pixels of said input digital image having at least a single color component that exceeds a corresponding predefined threshold as said first type pixels *(column 3 lines 61-65 disclose "same color" as an indication that color values fall within the threshold 'k', and column 6 lines 16-45 disclose taking color values that are considered "same colors" and grouping them in a region, for example the region disclosed in column 4 lines 21-24. This process is carried out for two regions as described in column 7 lines 51-54).*

Regarding claims 4 & 12, Fujimoto et al., discloses the method and apparatus of claims 1 & 10, respectively, wherein said step of converting said input digital image to said binary image includes dividing said pixels of said input digital image into first and second groups based on color differences of said pixels of said input digital image *(column 4 lines 7-13 disclose dividing the color image into regions).*

Regarding claims 5 & 13, Fujimoto et al., discloses the method and apparatus of claims 4 & 12 respectively, wherein said step of converting said input digital image to said binary image further includes converting said pixels of said input digital image that belong to a smaller group *(Region 2 of Fig 10 disclose a smaller grouping of pixel values)* of said first and second groups to said first type pixels of said binary image and converting said pixels of said input digital image that belong to a larger group *(Region 1 of Fig 10 disclose a larger grouping of pixel values)* of said first and second groups to said second type pixels of said binary image *(column 3 lines 61-65 disclose "same*

color" as an indication that color values fall within the threshold 'k', and column 6 lines 16-45 disclose taking color values that are considered "same colors" and grouping them in a region. This process is carried out for two regions as described in column 7 lines 51-54).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-8 & 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. (US 5,930,385) & Bar et al. (US 5,506,946).

Regarding claim 6, Fujimoto et al., discloses the method of claims 1, but does not disclose the said step of selectively inserting said colors into said pixels of said modified binary image to include inserting only colors from said input digital image into said pixels of said modified binary image.

However, Bar et al., disclose conversion of colors in an image to colors already existing in that image *(Figure 3e discloses selecting a target color and transforming the source color to the target color).*

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would not introduce new color to the image in the case of averaging two similar colors in the Fujimoto et al., method.

Regarding claim 7, the claim rejection of claim 6 is representative of claim 7. Bar et al., and Fujimoto et al., disclose the method of claim 6. Fujimoto et al., further disclose a method wherein said step of selectively inserting said colors into said pixels of said modified binary image includes:

comparing a particular pixel of said modified binary image with a corresponding pixel of said binary image (*column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k'*);

determining whether said particular pixel of said modified binary image substantially matches said corresponding pixel of said binary image (*column 6 lines 16-22 disclose determining if the two pixels match using the threshold value 'k'*);

Fujimoto et al., do not disclose inserting the color of a pixel of said input digital image from which said corresponding pixel of said binary image was derived into said particular pixel.

However, Bar et al., discloses inserting the color of one pixel into another *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would maintain only the colors original to the image in the Fujimoto et al., and Lund steps.

Regarding claim 8, the claim rejection of claim 7 is representative of claim 8. Bar et al., and Fujimoto et al., disclose the method of claim 7. Fujimoto et al., further disclose wherein said selectively inserting said colors into said pixels of said modified binary image further includes:

comparing said particular pixel of said modified binary image with neighboring pixels of said corresponding pixel of said binary image in a predefined sequence, if said particular pixel and said corresponding pixel do not substantially match *(column 6 lines 10-13 disclose comparing a target pixel with neighboring pixels. column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k')*;

Fujimoto et al., do not disclose inserting the color of a pixel of said input digital image that corresponds to a specific pixel selected from said neighboring pixels of said binary image that substantially matches said particular pixel of said modified binary image into said particular pixel, said specific pixel being a selected pixel of said neighboring pixels in said predefined sequence that substantially matches said particular pixel of said modified binary image.

However, Bar et al., discloses inserting the color of one pixel into another *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would maintain only the colors original to the image in the Fujimoto et al., and Lund steps.

Regarding claim 14, Fujimoto et al., discloses the apparatus of claim 10. Fujimoto et al., further disclose the steps of:

comparing a particular pixel of said modified binary image with a corresponding pixel of said binary image (*column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k'*);

determining whether said particular pixel of said modified binary image substantially matches said corresponding pixel of said binary image (*column 6 lines 16-22 disclose determining if the two pixels match using the threshold value 'k'*);

Fujimoto et al., do not disclose inserting the color of a pixel of said input digital image from which said corresponding pixel of said binary image was derived into said particular pixel.

However, Bar et al., disclose conversion of colors in an image to colors already existing in that image *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would not introduce new color to the image in the case of averaging two similar colors in the Fujimoto et al., steps.

Regarding claim 15, the claim rejection of claim 14 is representative of claim 15. Bar et al., and Fujimoto et al., disclose the method of claim 14. Fujimoto et al., further disclose wherein said selectively inserting said colors into said pixels of said modified binary image further includes:

comparing said particular pixel of said modified binary image with neighboring pixels of said corresponding pixel of said binary image in a predefined sequence, if said particular pixel and said corresponding pixel do not substantially match *(column 6 lines 10-13 disclose comparing a target pixel with neighboring pixels. column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k')*;

Fujimoto et al., do not disclose inserting the color of a pixel of said input digital image that corresponds to a specific pixel selected from said neighboring pixels of said binary image that substantially matches said particular pixel of said modified binary image into said particular pixel, said specific pixel being a selected pixel of said neighboring pixels in said predefined sequence that substantially matches said particular pixel of said modified binary image.

However, Bar et al., discloses inserting the color of one pixel into another *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would maintain only the colors original to the image in the Fujimoto et al., and Lund steps.

Claims 9 & 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. (US 5,930,385) & Lund (US 5,650,858).

Regarding claim 9, Fujimoto et al., discloses the method of claim 1 but does not disclose scaling, edge smoothing, and achieving a higher resolution by using a template matching technique.

However, Lund discloses the method wherein said step of changing the resolution of said binary image *(column 9 lines 24 discloses a black and white printer system)* includes scaling said binary image to a higher resolution binary image *(column 2 lines 43-45 discloses an inputted pixel image doubled, from 300 dpi to 600 dpi, to a relatively high resolution)* and smoothing edges of features of said higher resolution binary image *(column 2 lines 52-57 disclose edge-smoothing of the high resolution image)*, said scaling and smoothing being performed using a template matching technique *(column 3 lines 42-60 disclose template matching)*.

Accordingly, it would have been obvious to one of ordinary skill in the art to have used the template matching technique of Lund because *(column 3 line 65 – column 4 line 1)* the effect is improved print quality at higher resolution, and placed processing overhead borne by the printer and not the host computer of its user.

Regarding claim 16, Fujimoto et al., disclose a method of enhancing an input digital image having color features comprising:

converting said input digital image to a binary image *(column 2 lines 32-36 disclose an apparatus & method for image conversion of a color input into a monochrome document, column 5 lines 24-27 disclose conversion of a color image into a monochrome image)* of first and second type pixels such that pixels of said input digital image that define said color features are substantially converted to said first type pixels of said binary image *(Figure 3 discloses dividing the input image into regions for color specification, column 6 lines 56-59 disclose assigning blocks of image colors to regions)*;

and selectively inserting colors into said pixels of said modified binary image, said colors being derived from original colors of said input digital image *(column 8 lines 44-45 disclose assigning a color to each of the regions containing "same colors", in which, according to column 3 lines 61-64, "same color" includes slightly different color values that would be selectively assigned one particular color value, thus modifying the image. column 9 lines 18-19 & 39-41, disclose deriving inserted colors by determining region colors based on the original colors).*

Fujimoto et al., discloses changing the resolution of said binary image to derive a modified binary image *(column 11 lines 8-9 disclose converting the image input into a color image of different resolution)*, but does not disclose scaling the binary image to enhance binary features.

Lund discloses scaling the binary image *(column 2 lines 43-45 discloses an inputted pixel image doubled, from 300 dpi to 600 dpi, to a relatively high resolution)* to

enhance binary features *(column 2 lines 61-65, disclose the high resolution image is high quality).*

Accordingly, it would have been obvious to one of ordinary skill in the art to have used the scaling of Lund because *(column 3 line 65 – column 4 line 1)* the effect is improved print quality at higher resolution, and placed processing overhead borne by the printer and not the host computer of its user.

Regarding claim 17, the claim rejection of claim 16 is representative of claim 17. Fujimoto et al., and Lund disclose the method of claim 16. Fujimoto et al., disclose the method wherein said step of converting said input digital image to said binary image includes determining whether any color component of said input digital image exceeds a predefined threshold, said determination being used to classify said pixels of said input digital image as either said first type pixels or said second type pixels of said binary image *(column 6 lines 16-22, disclose comparing color components with the predefined threshold value 'k' and using it in determining to which region a pixel is grouped).*

Regarding claim 18, the claim rejection of claim 16 is representative of claim 18. Fujimoto et al., and Lund disclose the method of claim 16. Fujimoto et al., disclose the method wherein said step of converting said input digital image to said binary image includes separating said pixels of said input digital image to first and second groups based on spatial locations *(Fig 10, Regions 1 & 2)* of said pixels of said input digital

image on a color space*(column 4 lines 7-13 disclose dividing the color image into regions)*..

Regarding claim 19, the claim rejection of claim 18 is representative of claim 19. Fujimoto et al., and Lund disclose the method of claim 18. Fujimoto et al., disclose the method wherein said step of converting said input digital image to said binary image further includes converting said pixels of said input digital image that belong to a smaller group *(Region 2 of Fig 10 disclose a smaller grouping of pixel values)* of said first and second groups to said first type pixels of said binary image and converting said pixels of said input digital image that belong to a larger group *(Region 1 of Fig 10 disclose a larger grouping of pixel values)* of said first and second groups to said second type pixels of said binary image *(column 3 lines 61-65 disclose "same color" as an indication that color values fall within the threshold 'k', and column 6 lines 16-45 disclose taking color values that are considered "same colors" and grouping them in a region. This process is carried out for two regions as described in column 7 lines 51-54).*

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. (US 5,930,385), Bar et al. (US 5,506,946) & Lund (US 5,650,858).

Regarding claim 20, the claim rejection of claim 16 is representative of claim 20. Fujimoto et al., and Lund disclose the method of claim 16. Fujimoto et al., disclose the

method wherein said step of selectively inserting said colors into said pixels of said modified binary image includes:

comparing a particular pixel of said modified binary image with a corresponding pixel of said binary image (*column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k'*);

determining whether said particular pixel of said modified binary image matches said corresponding pixel of said binary image with respect to pixel values (*column 6 lines 16-22 disclose determining if the two pixels match using the threshold value 'k'*);

Fujimoto et al., and Lund do not disclose inserting the color of a pixel of said input digital image from which said corresponding pixel of said binary image was derived into said particular pixel.

However, Bar et al., disclose conversion of colors in an image to colors already existing in that image *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would maintain only the colors original to the image in the Fujimoto et al., and Lund steps.

Regarding claim 21, the claim rejection of claim 20 is representative of claim 21. Fujimoto et al., and Lund disclose the method of claim 20. Fujimoto et al., disclose the

method wherein said selectively inserting said colors into said pixels of said modified binary image further includes:

comparing said particular pixel of said modified binary image with neighboring pixels of said corresponding pixel of said binary image in a predefined sequence, if said particular pixel and said corresponding pixel do not match *(column 6 lines 10-13 disclose comparing a target pixel with neighboring pixels. column 6 lines 16-22 disclose comparing color components with the predefined threshold value 'k')*;

Fujimoto et al., and Lund do not disclose inserting the color of a pixel of said input digital image that corresponds to a specific pixel selected from said neighboring pixels of said binary image that matches said particular pixel of said modified binary image into said particular pixel, said specific pixel being a selected pixel of said neighboring pixels in said predefined sequence that matches said particular pixel of said modified binary image.

However, Bar et al., discloses inserting the color of one pixel into another *(Figure 3e discloses selecting a target color and transforming the source color to the target color)*.

Accordingly, it would have been obvious to one skilled in the art at the time of the invention to have used the conversion method of Bar et al., because it would maintain only the colors original to the image in the Fujimoto et al., and Lund steps.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle Pendergrass whose telephone number is (703) 306-3445. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor, David K. Moore can be reached on (703) 308-7452. The fax phone number for the organization where this application or proceeding is assigned in (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application of proceeding should be directed to the receptionist whose telephone number is (703) 305-9700.

KING Y. POON
PRIMARY EXAMINER